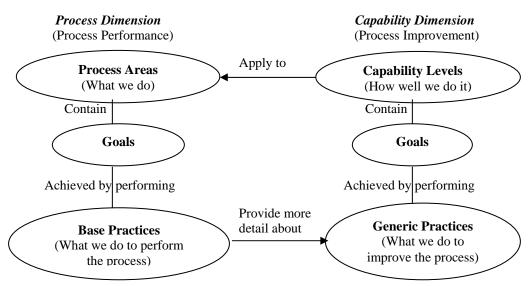
**Introduction:** This document summarizes major features and content of the FAA integrated Capability Maturity Model Version 2.0 (iCMM). It is provided as a quick reference for those using the iCMM to guide their process improvement efforts. Full details are provided in the iCMM, and its extensions, available at <a href="http://www.faa.gov/about/office\_org/headquarters">http://www.faa.gov/about/office\_org/headquarters</a> offices/aio/.

Context of Use: Any organization pursuing process improvement first examines its business objectives and the processes it performs to accomplish those objectives. Within this business context, the organization compares its practices to those in the relevant parts of the iCMM to identify areas where improvements might be pursued. The iCMM is used selectively, as applicable to the objectives of the organization. Associated with the iCMM are a variety of methods that can be used to measure organizational performance in relation to the iCMM, or the results of process performance in terms of usefulness and/or cost effectiveness. These are described in the FAA-iCMM Appraisal Method, at <a href="http://www.faa.gov/about/office\_org/headquarters">http://www.faa.gov/about/office\_org/headquarters</a> offices/aio/.

Scope/Sources: The iCMM provides enterprise-wide best practice guidance and continues to evolve. It addresses management at several levels, acquisition, supply, engineering, the full product or service lifecycle, quality management, high performance, and a broad range of supporting processes. The practices in the iCMM have been integrated from 10 sources, including ISO 9001, ISO/IEC 12207, ISO/IEC 15288, ISO/IEC 15504, Malcolm Baldrige National Quality Award Criteria, EIA 731, CMMI, Software Acquisition CMM, CMM for Software, and Systems Engineering CMM. A detailed mapping table supplement, indicating how these sources were integrated, is available at <a href="http://www.faa.gov/about/office\_org/headquarters\_offices/aio/">http://www.faa.gov/about/office\_org/headquarters\_offices/aio/</a>. Use of the iCMM affords improvement against all source models simultaneously and can result in appraisal results/certifications against several source models via a single appraisal.

**General Structure of the iCMM:** The practices in the iCMM are structured into 2 parts: the *process dimension*, with practices specific to performing a selection of processes, and the *capability dimension*, with practices that are used generically to improve the way any process is performed. Within the process dimension, practices are grouped into Process Areas, and within the capability dimension, practices are grouped into Capability Levels. Both Process Areas and Capability Levels contain goals expressing what should be achieved if their associated practices are performed. Some practices in the process dimension provide additional detail regarding practices in the capability dimension. This structure is illustrated below.



The Process Dimension: There are 24 process areas (PAs) in the process dimension of the iCMM. Some of these process areas pertain to Management activities, some to Life Cycle activities, and some to Support activities. These process areas are numbered for convenience of reference. Most of these process areas are assigned a maturity level designation providing guidance on which process areas might be improved together, or next. These designations also offer iCMM maturity levels for the purpose of benchmarking with organizations that measure their accomplishments using the maturity levels of a variety of CMMs that are sources to the iCMM. Since the iCMM integrates many standards and models besides CMMs however, some process areas that are not in other CMMs are designated as "not staged" for benchmarking purposes.

**The Capability Dimension:** There are 6 capability levels (CLs) in the capability dimension of the iCMM. Any of the processes in the process dimension may be being performed at any of these capability levels.

### **Maturity Level (ML) Definitions:**

- Maturity Level 2: To achieve maturity level 2, all nine process areas staged at maturity level 2 must have satisfied capability levels 1 and 2 (or be not applicable).
- **Maturity Level 3:** To achieve maturity level 3, all 20 process areas staged at maturity level 2 and maturity level 3 must have satisfied capability levels 1, 2, and 3 (or be not applicable).
- **Maturity Level 4:** To achieve maturity level 4, all 20 process areas staged at maturity level 2 and maturity level 3 must have satisfied capability levels 1, 2, and 3 (or be not applicable) and selected process areas additionally must have satisfied capability level 4.
- Maturity Level 5: To achieve maturity level 5, all 21 process areas staged at maturity levels 2, 3, and 5 must have satisfied capability levels 1, 2, and 3 (or be not applicable) and selected process areas additionally must have satisfied capability levels 4 and 5.

**Special Application Areas:** The iCMM includes a feature to facilitate use of the model in the context of special applications. This construct, called an application area (AA), includes purpose, application goals, application practices, and identification of the practices in the iCMM that are used to implement each application practice. The first application area addresses Safety and Security, and integrates 4 safety standards and 4 security standards (see Safety and Security Extensions at <a href="http://www.faa.gov/about/office\_org/headquarters">http://www.faa.gov/about/office\_org/headquarters</a> offices/aio/)

**Contents of this Document:** The subsequent pages of this document summarize the Process Dimension and the Capability Dimension of the iCMM, listing their goals and practices.

Process Dimens	sion		
Category	Process Area	ML Staging	See page
Management	PA 00 Integrated Enterprise Management	ML 3	3
	PA 11 Project Management	ML 2	7
	PA 12 Supplier Agreement Management	ML 2	8
	PA 13 Risk Management	ML 3	8
	PA 14 Integrated Teaming	ML 3	9
Life Cycle	PA 01 Needs	ML 3	3
	PA 02 Requirements	ML 2	3-4
	PA 03 Design	ML 3	4
	PA 06 Design Implementation	ML 3	5
	PA 07 Integration	ML 3	5-6
	PA 08 Evaluation	ML 2	6
	PA 09 Deployment, Transition, and Disposal	ML 2	6
	PA 10 Operation and Support	Not staged	7
Support	PA 04 Alternatives Analysis	ML 3	4-5
	PA 05 Outsourcing	ML 2	5
	PA 15 Quality Assurance & Management	ML 2	9
	PA 16 Configuration Management	ML 2	10
	PA 17 Information Management	Not staged	10
	PA 18 Measurement and Analysis	ML 2	10
	PA 19 Work Environment	Not staged	11
	PA 20 Process Definition	ML 3	11
	PA 21 Process Improvement	ML 3	11
	PA 22 Training	ML 3	12
	PA 23 Innovation	ML 5	12
Special Apps	AA 01 Safety and Security	Not staged	13
Capability Dime	ension		
CL Number	Capability Level Name		See page
0	Incomplete		14
1	Performed		14
2	Managed: Planned and Tracked		14
3	Defined		14
4	Quantitatively Managed		14
5	Optimizing		14

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# iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

**PA 00 INTEGRATED ENTERPRISE MANAGEMENT:** to establish the vision, mission, values, goals, and objectives of the enterprise; establish and maintain strategic plans to accomplish goals and objectives; initiate and monitor projects/activities to advance the business of the enterprise; evaluate performance relative to goals and needs; and enable individuals to function effectively by sharing a common understanding of enterprise vision, culture, and goals.

#### Goals

- 1. Vision, mission, values, performance goals and objectives are established, maintained, and communicated to all employees.
- 2. Strategies are developed and projects are launched that visibly support goal achievement.
- 3. Projects are continued, changed, or terminated based on performance, within the capability of the organization, and with acceptable risk and potential benefit to the organization.

## **Base Practices**

**BP 00.01 Establish and Maintain Strategic Vision.** Establish, maintain, and communicate a strategic vision that identifies long-term goals, values, performance expectations, and core activities.

**BP 00.02** Align to Achieve the Vision. Align the enterprise to operate efficiently and consistently to achieve the vision.

**BP 00.03. Establish and Maintain Strategy**. Establish and maintain the enterprise strategic plans that identify business objectives to be achieved, areas of business to be pursued and their interrelationships, and the significant goals to be accomplished.

**BP 00.04. Develop and Deploy Action Plans**. Establish, integrate, and deploy tactical action plans to accomplish strategic objectives.

**BP 00.05.** Review Performance. Review performance relative to goals and changing needs across the enterprise.

**BP 00.06.** Act on Results of Review. Translate performance review findings into action.

**BP 00.07. Fulfill Public Responsibility**. Address the impacts on society of planned activities, products, services, and operations, considering regulatory and legal requirements and risks associated with products, services, and operations.

**PA 01 NEEDS:** to elicit, analyze, clarify, and document evolving customer and other stakeholder needs and expectations, and to establish and maintain communication with the customer and other stakeholders throughout the life cycle to assure a continuous understanding of what will satisfy those needs.

### Goals

- 1. A statement of customer and other stakeholder needs and expectations is established and maintained.
- 2. A description of the interaction of needed products and services with users in the intended environment is defined.
- 3. Communication with the customer and other stakeholders is established and maintained.
- 4. Customer satisfaction with products and services is determined and monitored.

#### **Base Practices**

BP 01.01 Identify Customers and Stakeholders. Identify customers and stakeholders.

BP 01.02 Elicit Needs. Elicit customer and other stakeholders' needs, expectations, and measures of effectiveness.

BP 01.03 Analyze Needs. Analyze needs and expectations in the context of the intended operational environment.

**BP 01.04 Establish and Maintain a Statement of Need**. Establish and maintain a statement of customer and other stakeholder needs and expectations that is understood and agreed upon by the customer and other stakeholders.

**BP 01.05 Communicate with Customers**. Communicate and interact with customers and other stakeholders throughout the life cycle to assure a common understanding of the status and disposition of needs, expectations, and measures of effectiveness.

BP 01.06 Determine Customer Satisfaction. Determine customer satisfaction with products and services.

**PA 02 REQUIREMENTS:** to develop requirements that meet customer needs; analyze the product, service and other requirements; derive a detailed and precise set of requirements; and manage those requirements throughout the life cycle.

## Goals

- 1. Requirements are derived from customer and other stakeholder needs.
- 2. Requirements are unambiguous, complete, traceable, feasible, and verifiable.
- 3. All requirements information is recorded and controlled to establish a baseline that is maintained throughout the life cycle.
- 4. Plans, products, activities, and agreements are checked for consistency with requirements, and any inconsistencies are identified for correction.

# iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

### **Base Practices (for PA 02 Requirements)**

**BP 02.01 Identify Functional and Performance Requirements**. Identify functional and performance requirements, and required product or service attributes, including any requirements pertaining to safety, security, human factors, or other specialized areas.

**BP 02.02 Identify Nonfunctional Requirements and Constraints**. Identify requirements and constraints pertaining to processes used in providing the required product or service, and pertaining to the context or intended operational environment.

**BP 02.03 Identify Key Requirements**. Identify key requirements that have a strong influence on cost, schedule, functionality, risk, or performance, or that are critical to customers and other stakeholders.

**BP 02.04 Derive Requirements**. Derive requirements that may be identified as necessary implications of stated functional, nonfunctional, interface, or other derived requirements.

**BP 02.05 Identify External Interface Requirements**. Identify the requirements associated with external interfaces to the system, product, or service.

**BP 02.06 Analyze Requirements**. Analyze requirements to ensure that they satisfy established quality criteria including unambiguity, completeness, traceability, feasibility, and verifiability.

**BP 02.07 Record and Baseline Requirements**. Record, approve, baseline, and place under change control all requirements, derived requirements, derivation rationale, traceability, and requirements status.

**BP 02.08 Analyze and Resolve Requirements Change Requests**. Analyze all requirements change requests for impact on the product or service and, upon approval, incorporate the approved changes into the requirements baseline.

**BP 02.09 Maintain Consistency and Traceability**. Maintain traceability among requirements and between requirements and plans, work products, and activities, initiating corrective action if inconsistencies are identified.

**PA 03 DESIGN:** to establish and maintain an architecture and design solution for the needs and requirements of the customer and other stakeholders.

#### Goals

- 1. A product or service design that will meet the defined requirements is established and maintained.
- 2. The established product or service design is based on an evaluation of alternatives against criteria that represent the requirements.
- 3. Allocations of requirements to the design elements are established and maintained.

### **Base Practices**

**BP 03.01 Identify and Prioritize Design Issues**. Establish and use a mechanism to capture, prioritize, and resolve product and service design issues.

**BP 03.02 Develop Design Structure**. Evaluate alternatives against established criteria to select the architecture, structure, and elements for the product or service design.

**BP 03.03 Develop Interface Specifications**. Develop interface specifications for the selected product and service elements.

**BP 03.04 Allocate Requirements**. Allocate product and derived requirements to the design elements and interfaces, and to personnel or processes where appropriate.

**BP 03.05 Define Interactions among Design Elements**. Define the dynamic interactions and operational sequences among design elements.

**BP 03.06 Establish Component Specifications.** Establish design specifications for each element of the product or service.

**BP 03.07 Establish and Use a Strategy for Non-developmental Items**. Establish and use a strategy for managing issues relating to the use of non-developmental item (NDI) product and service elements.

**BP 03.08 Establish and Maintain Design Description**. Establish and maintain a complete description of the product and service design.

**PA 04 ALTERNATIVES ANALYSIS:** to apply structured analysis and decision-making to selected issues and communicate the results to stakeholders.

## Goals

- 1. Strategies are established and maintained that support the analysis of alternatives and structured decision-making.
- 2. Alternative solutions to selected issues are analyzed and solutions selected or recommended in accordance with established strategy and criteria.
- 3. Results and rationale of alternatives analysis are documented and communicated.

# iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

## **Base Practices (for PA 04 Alternatives Analysis)**

**BP 04.01 Establish Analysis Strategy**. Establish and maintain an alternatives analysis strategy that provides guidelines for when and how to use structured analysis and decision methods.

**BP 04.02 Define the Problem**. Define the problem and establish criteria and their relative importance for evaluating alternative solutions.

BP 04.03 Select Analysis Method. Select alternatives analysis methods and document the rationale for their choice.

BP 04.04 Identify Alternative Solutions. Identify and document alternative solutions to problems or issues.

**BP 04.05 Analyze Alternative Solutions**. Analyze alternative solutions in accordance with the selected alternatives analysis method and evaluation criteria.

**BP 04.06 Select Solution.** Select or recommend solution(s) that best meet the criteria and goals of the analysis.

BP 04.07 Communicate Analysis Results. Document and communicate alternatives analysis results to stakeholders.

**PA 05 OUTSOURCING:** to identify the portions of the solution and support structure that are to be provided from outside the organization, identify potential sources, and select the supplier for the needed capability.

### Goals

- 1. Needs for outsourcing are determined.
- 2. Qualified suppliers are selected to provide solution or process components.
- 3. A productive communications environment is established and maintained with potential suppliers.

### **Base Practices**

**BP 05.01 Identify Needed Products or Services**. Identify needed solution or process components that may be provided by other/outside organizations

**BP 05.02 Identify Competent Suppliers**. Identify suppliers that have shown expertise or capability in the identified areas.

**BP 05.03 Prepare for the Solicitation or Tasking**. Prepare for the solicitation/tasking and the selection of a supplier, including objective review of estimates of cost for the services/products to be outsourced, a clear description of tasking, and inclusion of evaluation criteria in the solicitation/tasking package.

BP 05.04 Choose Supplier. Choose suppliers in accordance with the selection strategy and criteria.

**BP 05.05 Communicate with Suppliers**. Establish and maintain communication with suppliers emphasizing the needs, expectations, and measures of effectiveness held by the acquirer for the solution or process components that are being acquired.

### PA 06 DESIGN IMPLEMENTATION: to produce a specified solution component.

## Goals

- 1. Solution component(s) are developed.
- 2. Documentation to support solution component(s) is established and maintained.

### **Base Practices**

**BP 06.01 Establish the Implementation Environment**. Establish the methods, standards, and tools to be used to implement the solution component(s) strategy.

BP 06.02 Formulate Product or Service Components. Formulate solution components according to the specifications.

**BP 06.03 Develop Documentation**. Develop and maintain the documentation that will be used to operate and maintain the product or service components.

## PA 07 INTEGRATION: to ensure that product and service elements will function as a whole.

#### Goals

- 1. A strategy for integrating the product and service elements is defined.
- 2. Readiness of product and service elements for integration is verified.
- 3. The product or service is integrated in accordance with the integration strategy.

#### Base Practices (see also next page)

**BP 07.01 Develop Integration Strategy** Develop an integration strategy and supporting documentation that identify the sequence for receipt, assembly, and activation of the various elements that make up the product or service.

**BP 07.02 Confirm Readiness of Product and Service Elements**. Confirm the readiness of each product and service element in accordance with the integration strategy schedule and quality standards.

## iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

## Base Practices of PA 07 Integration, continued

**BP 07.03 Review and Coordinate Interface Definitions**. Review and coordinate product and service element interface definition, design, and change between affected groups and individuals throughout the life cycle.

**BP 07.04 Assemble Product and Service Elements**. Assemble or integrate product and service elements in accordance with the integration strategy.

**BP 07.05 Confirm Integrated Product or Service Operation**. Confirm that the integrated product or service functions to the extent required for evaluation.

**PA 08 EVALUATION:** to confirm that developed and acquired products and services satisfy specified requirements and operational needs, and identify and document actual and potential defects in evolving product and service elements.

#### Goals

- 1. The evaluation approach, requirements, methods, and environment are established to provide an objective basis for determining whether the products and services meet requirements and can be accepted.
- 2. Evaluations are performed as planned.
- 3. Analyses are conducted on results of evaluations to support acceptance or corrective actions.

### **Base Practices**

**BP 08.01 Develop Evaluation Strategy**. Establish and maintain a comprehensive strategy and requirements for evaluating products and services throughout their life cycle.

**BP 08.02 Develop Evaluation Procedures**. Develop the detailed procedures, methods, and processes to be used in evaluating products and services.

**BP 08.03 Establish and Maintain Evaluation Environment**. Establish and maintain the tools, facilities, personnel, documentation, and environment needed to perform planned evaluations.

BP 08.04 Evaluate Incremental Work Products. Evaluate incremental work products and services.

**BP 08.05 Verify End-products**. Evaluate end-products and services against specified requirements.

**BP 08.06 Validate End-products**. Evaluate the capability of end-products and services to fulfill their intended use in representative operational environments.

**BP 08.07 Analyze Evaluation Results**. Analyze results of evaluations and compare them to the needs and requirements to identify and quantify deficiencies, and recommend corrective and preventive actions.

**PA 09 DEPLOYMENT, TRANSITION AND DISPOSAL:** to place a product or service into an operational environment, transfer it to the customer/stakeholder and to the support organization, and deactivate and dispose of the replaced product and/or dispense with the service.

### Goals

- 1. Customer/ stakeholder operation and support facilities are prepared to accept the delivery, placement and transition of the product or service into use.
- 2. Customer/ stakeholder operation and support personnel are prepared to accept delivery, placement and transition of the product or service into use.
- 3. Customer/ stakeholder operation and support organizations demonstrate their capacity to support the product or service upon assumption of responsibility.
- 4. Continuity of operational performance is maintained.
- 5. The replaced product or service is deactivated, disposed and/or dispensed of, as appropriate.

### **Base Practices**

**BP 09.01 Develop, Deploy, and Maintain a Strategy for Deployment, Transition and Disposal Activities.** Develop a strategy for deployment, transition, and disposal and perform activities in accordance with the strategy.

**BP 09.02 Prepare Facility and Infrastructure Environment**. Establish the facility and infrastructure environment to receive and operate the product or service.

**BP 09.03 Oversee Configuration of Product or Service**. Verify fielded configuration items reflect the product or service baseline and manage change control.

**BP 09.04 Demonstrate Support Capability**. Demonstrate the ability of the customer/stakeholder support organization to maintain, modify and support the product or service.

**BP 09.05 Transition Product or Service.** Transfer the product or service to the customer/stakeholder operation and support organizations.

BP 09.06 Deactivate and Dispose Replaced Product and/or Dispense with Service. Deactivate and dispose of the replaced product and/or dispense with the replaced service.

## iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

**PA 10 OPERATION AND SUPPORT:** to operate the product, system, or service; support its users; monitor and sustain its performance; and take or initiate corrective action as required.

#### Goals

- 1. The product, system, or service is operated and monitored.
- 2. Methods are established and used to sustain required service levels and to detect the need for corrective action.
- 3. Operational support is provided and needed corrective actions are deployed.

### **Base Practices**

**BP 10.01 Operate the System, Product or Service**. Operate the system, product, or service in its intended environment and in the specified way.

**BP 10.02 Monitor and Evaluate Capacity, Service, and Performance**. Monitor and evaluate capacity, service, and performance of the system, product, or service.

**BP 10.03 Confirm Availability of Parts and Personnel.** Confirm availability of required resources (personnel and parts) to ensure service levels can be sustained.

**BP 10.04 Perform Preventive Maintenance.** Perform preventive maintenance by replacing or servicing products/system elements prior to failure.

**BP 10.05 Analyze Failures**. Perform failure identification actions when a non-compliance has occurred in the product or delivered service.

**BP 10.06 Take or Initiate Corrective Action**. Take corrective action when appropriate (e.g., defective part, human error), or initiate corrective action for product or service modification.

**BP 10.07 Provide Customer Support.** Establish a service to answer customer and user questions and help resolve problems they encounter.

**PA 11 PROJECT MANAGEMENT:** to ensure the project achieves its objectives, by planning, directing, tracking, and controlling the activities necessary for development and delivery of required products and services.

### Goals

- 1. Project plans are established, maintained and executed to provide required products and services that reflect customer and stakeholder needs.
- 2. Estimates of the project's planning parameters are established and maintained to support resource estimates.
- 3. Commitments related to the project are established and maintained.
- 4. Progress of the project is evaluated against its plans.
- 5. Corrective actions are taken when appropriate and managed to closure.

### **Base Practices**

**BP 11.01 Define Project Objectives, Scope, and Outputs**. Define project objectives, scope, and the work products and services that are to be provided by the project.

BP 11.02 Define the Activities and Life Cycle Approach. Define the activities needed to achieve project outputs and the life-cycle approach that will be used.

**BP 11.03 Estimate Planning Parameters**. Estimate and document the work product and task planning parameters that provide a basis for resource estimates.

**BP 11.04 Estimate Project Resource Requirements.** Estimate the project effort, cost, and other resource requirements.

BP 11.05 Establish Schedules. Develop management and technical schedules for the project.

**BP 11.06 Establish and Maintain Plans**. Establish and maintain a complete set of plans for providing the products and services throughout the project life cycle.

**BP 11.07 Establish Commitment**. Establish and maintain commitment of affected groups and individuals to project objectives and plans, and commitment of resources as identified in the plan.

**BP 11.08 Organize to meet Project Objectives**. Identify individuals or teams that will be assigned the resources and responsibilities for meeting project objectives.

**BP 11.09 Direct the Project.** Communicate project plans, direction, corrective actions, and status, and coordinate project activities.

**BP 11.10 Monitor Project Performance**. Monitor and track project activities and results against plans.

**BP 11.11 Review and Analyze Project Performance**. Conduct formal and informal reviews of project performance and analyze variances from plans.

BP 11.12 Take Corrective Action. Take corrective actions to address problems.

## iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

**PA 12 SUPPLIER AGREEMENT MANAGEMENT:** to ensure that the activities described in agreements are being performed, and that evolving products and services will satisfy requirements described in agreements.

#### Goals

- 1. The documented agreement is kept consistent with the acquirer's requirements and relevant laws, policies, regulations, and other applicable guidance.
- 2. Supplier performance, processes, products and services are reviewed and monitored to identify problems and to ensure that products and services conform to requirements.
- 3. Measurements are used to track the supplier's performance.
- 4. Communications between the acquirer and the supplier are established and maintained to foster a cooperative and productive agreement environment.
- 5. Acceptance of deliverable products or services is based on the supplier meeting the terms and conditions described in the agreement.

#### **Base Practices**

- **BP 12.01 Use Planning Documents**. Ensure the supplier adheres to acquirer-approved planning documents.
- **BP 12.02 Review and Monitor Agreement Performance.** Review and monitor supplier activities through periodic formal reviews and informal, technical issue interchanges with the supplier, and by quantitative means to continuously determine agreement outcomes versus plans and requirements.
- **BP 12.03 Maintain Supplier Agreement Integrity**. Ensure agreements comply with current laws, policies and regulations, and incorporate necessary and approved changes into the agreement.
- BP 12.04 Monitor Supplier's Plans, Processes, Activities and Products. Monitor supplier's quality assurance, configuration management, test, corrective action and risk management systems, plans and process activities, results, and products.
- **BP 12.05 Foster Cooperative and Collaborative Environment**. Perform activities to foster a partnership between the acquiring organization and the supplier.
- BP 12.06 Analyze and Direct Agreement Activities. Analyze and direct the performance of agreement activities.
- **BP 12.07 Administer Supplier Agreement.** Ensure the agreement is being maintained and followed, and all changes and records are properly processed, controlled and maintained.
- **BP 12.08 Determine Product or Service Acceptance.** Determine whether to accept the supplier's product or service, based on acceptance conditions stipulated in the agreement.

**PA 13 RISK MANAGEMENT:** to identify and analyze risks to the achievement of project objectives and to execute plans that reduce the likelihood and/or consequence of risks that meet mitigation criteria.

# Goals

- 1. A risk management strategy is established and used that includes the plans, methods and parameters for management of risk.
- 2. Risks are identified and assessed for their likelihood and consequence.
- 3. Risk mitigation is performed when analysis indicates action.
- 4. Risk mitigation actions are monitored to determine their effectiveness and corrective action is taken as needed.

### **Base Practices**

- **BP 13.01 Develop Risk Management Approach**. Establish and maintain an approach for managing risk that is the basis for identifying, assessing, mitigating, and monitoring risks for the life of the project.
- **BP 13.02 Identify Risks**. Identify project risks by examining objectives, alternatives, and constraints in the context of established sources of risk.
- BP 13.03 Assess Risks. Assess risks to determine their likelihood of occurrence and the consequences if they occur.
- **BP 13.04 Develop Risk Mitigation Plans**. Develop risk mitigation plans for risks that meet risk action criteria defined by the risk management approach.
- **BP 13.05 Implement and Monitor Risk Mitigation Plans**. Implement, monitor, and control risk mitigation activities in accordance with risk mitigation plans.

## iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

**PA 14 INTEGRATED TEAMING:** to identify and maintain the disciplines and stakeholders necessary to effectively accomplish appropriate multidisciplinary/cross-functional missions, to create integrated teams as appropriate, and to establish and maintain a supportive teaming environment.

#### Goals

- 1. Integrated teams composed of appropriate disciplines and stakeholders are established and maintained.
- 2. Team processes and methods are established and maintained for effective coordination, collaboration, communication, conflict resolution and decision-making.

#### **Base Practices**

- **BP 14.01 Develop and Communicate Team Goals.** Develop team-shared vision, goals and objectives.
- **BP 14.02 Establish and Maintain Integrated Teams.** Where the application is appropriate, establish and maintain empowered teams that integrate the necessary disciplines and stakeholders at the proper points in time throughout the life of a product or service to collaboratively accomplish team goals.
- **BP 14.03 Establish and Maintain a Collaborative Workplace.** Create a working environment conducive to effective cross-discipline/cross-functional coordination and communication.
- **BP 14.04 Establish Coordination and Communication Methods.** Establish methods for coordination and communication among team members and with affected teams, organizations and individuals.
- **BP 14.05 Establish Resolution Methods.** Establish and use methods for identifying and resolving issues cutting across disciplines and stakeholder interests, for decision making, and for escalating unresolved issues to management.
- **BP 14.06 Communicate Integrated Team Activity Results.** Communicate results of integrated team activities to team members and to other teams, organizations and individuals engaged in, or affected by, the team's work project(s)/products.

**PA 15 QUALITY ASSURANCE AND MANAGEMENT:** to ensure the quality of the product or service, ensure the quality of the processes used to create or provide the product or service, and provide management with appropriate visibility into the processes and product.

#### Goals

- 1. Adherence of work products, services, and activities to applicable standards, procedures, and requirements is verified objectively.
- 2. Noncompliance issues are tracked and those that cannot be resolved at the project level are addressed by senior management.
- 3. Affected groups and individuals are informed of quality assurance activities, and results.
- 4. Causes of defects are sought out, identified, prioritized, corrected, and methods of elimination are evaluated.
- 5. Quality improvement opportunities are initiated with the appropriate stakeholders.

#### **Base Practices**

- **BP 15.01 Establish a Quality Management System.** Establish, document, implement, and maintain a quality management system.
- **BP 15.02 Monitor Process Compliance.** Objectively monitor compliance of performed activities with the established processes throughout the life cycle.
- **BP 15.03 Monitor Product and Service Quality.** Objectively measure work products and services against the requirements and standards that define them.
- **BP 15.04 Record and Report Results.** Record and report the results of quality assurance activities to applicable stakeholders.
- **BP 15.05 Analyze Quality.** Analyze quality records and measurements to detect the need for corrective action and develop recommendations for quality improvement or corrective and preventive actions.
- **BP 15.06 Initiate Quality Improvement.** Initiate activities that address identified quality issues or quality improvement opportunities.
- BP 15.07 Evaluate the Effect of Changes. Evaluate the effect of changes after they have been implemented.

## iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

**PA 16 CONFIGURATION MANAGEMENT:** to establish and maintain data on and status of identified configuration items, analyze and control changes to the identified items, and to establish and maintain the integrity between the identified work products and their data throughout the project's life cycle.

#### Goals

- 1. Configuration items that are to be managed are identified.
- 2. Configuration items are controlled and managed throughout the life cycle.
- 3. Status of configuration items is recorded and reported to all stakeholders.
- 4. The integrity of baselines and work products is assured.

#### **Base Practices**

**BP 16.01 Establish a Configuration Management Strategy.** Establish roles, responsibilities, and methods for the application of CM activities.

**BP 16.02 Identify and Baseline Configuration Items and Interim Work Products**. Identify configuration items, interim work products, and work environment items that will be baselined or placed under version control, and baseline them.

**BP 16.03 Establish and Maintain a Repository for Work Product Baselines**. Establish and maintain a repository to house work product baselines.

**BP 16.04 Control Changes**. Control changes to baselined work products through tracking, recording, review, and approval processes throughout the life cycle.

**BP 16.05 Record and Report Configuration Status**. Record and report change information about the baselined configuration items.

**BP 16.06 Conduct Configuration Audits and Inspections**. Conduct configuration audits and inspections to verify integrity of the baselines and check the work products for compliance with the baselines.

**PA 17 INFORMATION MANAGEMENT:** to make relevant, and timely information available to those who need it during and after the lifetime of products and services.

## Goals

- 1. An infrastructure is established and maintained to provide the mechanisms and media needed to support the information management at project, organization and enterprise levels.
- 2. Information is managed in accordance with established requirements and strategy.
- 3. Information is stored and protected from loss, damage, and unwarranted access.
- 4. Timely access to information is available to those that need it.

### **Base Practices**

**BP 17.01 Establish Information Management Strategy.** Establish and maintain a strategy and requirements for information management.

**BP 17.02 Establish Information Management Capability.** Establish an infrastructure for information management including repository, tools, equipment, and procedures.

**BP 17.03 Store Information**. Collect, receive, and store information according to established strategy and procedures.

BP 17.04 Share Information. Disseminate or provide timely access to information to those that need it.

**BP 17.05 Protect Information**. Protect information from loss, damage, or unwarranted access.

**BP 17.06 Establish Information Standards**. Establish requirements and standards for content and format of selected information items.

**PA 18 MEASUREMENT AND ANALYSIS:** to collect and analyze data related to processes and resulting products and services to provide quantitative insight into performance relative to goals.

## Goals

- 1. Measures related to goals, objectives and major issues are established.
- 2. Measurement data are collected, analyzed, and results are reported.
- 3. Measurement data and results are stored for use.

#### **Base Practices**

**BP 18.01 Establish Measures Based on Goals**. Establish measurable objectives from issues and goals and identify the specific measures that will provide the basis for performance analysis.

BP 18.02 Collect Relevant Measurement Data. Collect and verify measurement data and generate results.

**BP 18.03 Store Data and Results.** Store measurement data and results in a repository.

BP 18.04 Analyze Measurement Data. Analyze data to determine performance against goals.

BP 18.05 Communicate Results. Report results of measurement and analysis to all affected stakeholders.

## iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

**PA 19 WORK ENVIRONMENT** (added to iCMM v2.0 in 2004): to ensure that people have infrastructure and working procedures to perform their work effectively.

#### Goals

1. A work environment that meets stakeholder needs and requirements is established and maintained.

### **Base Practices**

**BP 19.01 Determine Work Environment Needs.** Establish and maintain the needs and requirements to implement, operate, and sustain work environments.

**BP 19.02 Establish Work Environment Standards.** Establish and maintain a description of work environment standards and tailoring guidelines that meet identified needs and requirements.

**BP 19.03 Establish Work Environment.** Establish and maintain a work environment, tailored from the work environment standards, to meet the specific needs.

**BP 19.04 Maintain the Qualification of Components.** Maintain the required qualification of work environment components.

**BP 19.05 Maintain the Qualification of Personnel.** Ensure that personnel have the required competencies and qualifications to access, use, and maintain the work environment.

**BP 19.06 Maintain Technology Awareness.** Monitor, evaluate, and insert, as appropriate, new technology for improving the work environment.

BP 19.07 Ensure Work Environment Continuity. Plan and provide for continuity of the work environment.

**PA 20 PROCESS DEFINITION:** to define and maintain a standard set of process assets that support organizational learning and improve process performance.

#### Goals

- 1. The set of standard processes is established and maintained.
- 2. Guides for tailoring the standard processes are established and maintained.
- 3. Goals, performance data, and other assets that support the processes are collected, maintained, and communicated.

### **Base Practices**

BP 20.01 Establish Standard Processes. Establish and maintain a set of standard processes.

**BP 20.02 Develop Tailoring Guidelines.** Establish and maintain tailoring guidelines for the set of standard processes and ensure their use.

BP 20.03 Maintain Process Assets. Collect and maintain process assets.

**BP 20.04 Coordinate and Communicate Process Definition.** Coordinate and communicate process definition and improvement activities.

**PA 21 PROCESS IMPROVEMENT:** to continuously improve the effectiveness and efficiency of the project and/or organization's processes so that its business is conducted more efficiently and effectively.

### Goals

- 1. Goals for processes improvement are established and progress towards them is evaluated.
- 2. Process improvement activities are coordinated across projects and the organization.
- 3. Improvements are deployed, monitored, and sustained within the project and organization.

#### **Base Practices**

**BP 21.01 Identify Process Improvement Goals.** Identify process improvement goals from the organization's business goals.

BP 21.02 Establish Process Improvement Program. Plan improvements to the project/organization's processes based on widespread participation and analysis of the impact of potential improvements on achieving the goals of the organization.

**BP 21.03 Appraise Process.** Appraise the processes periodically.

**BP 21.04 Establish an Action Plan.** Analyze appraisal results and other sources for improvement and establish an action plan for process improvement.

**BP 21.05 Implement Improvements.** Implement the process improvement action plan.

BP 21.06 Confirm Improvements. Confirm that improvement activities meet goals and desired results.

**BP 21.07 Sustain and Deploy Improvement Gains.** Sustain and deploy improvement gains across all applicable parts of the organization/project.

**BP 21.08 Monitor Performance.** Continuously monitor and improve process performance.

## iCMM v2.0 Process Dimension: Process Areas, Purpose, Goals, and Base Practices

**PA 22 TRAINING:** to develop and maintain the skills and knowledge of people so they perform their roles effectively and efficiently.

#### Goals

- 1. Training needs are solicited and identified.
- 2. Required training is provided.
- 3. Training effectiveness is assessed.

#### **Base Practices**

- **BP 22.01 Identify Training Needs.** Identify training needs for the organization, projects, teams, and support groups.
- BP 22.02 Establish Training Plan. Establish and maintain a training plan.
- **BP 22.03 Establish Training Mechanism.** Establish and maintain training capability and delivery mechanisms to address identified training needs.
- BP 22.04 Train Individuals. Train individuals to have the skills and knowledge needed to perform their assigned roles.
- BP 22.05 Establish and Maintain Records. Establish and maintain records of training and experience.
- BP 22.06 Assess Training Effectiveness. Assess the effectiveness of training to meet identified training needs.
- BP 22.07 Establish Learning Environment. Establish and maintain an environment that encourages learning.

**PA 23 INNOVATION:** to identify, select, and introduce selected technology improvements into products, processes, and the work environment to improve the organization's business results.

#### Goals

- 1. Agile adaptation to change is driven by the organization's knowledge of its products, processes, technologies, and core competencies.
- 2. The organization's products, services, processes, and work environment are continually evaluated for suitability to use identified improvements and innovations.
- 3. Selected technologies are deployed to relevant parts of the organization in accordance with the organization's objectives and goals.

#### **Base Practices**

- **BP 23.01 Maintain New Technology Awareness.** Maintain awareness of new technologies that support the organization's goals.
- BP 23.02 Select New Technologies. Choose new technologies to adopt based on established criteria.
- **BP 23.03 Prepare for Infusion.** Perform the necessary preliminary activities to ensure that technology infusion will be successful and will advance the organization's goals.
- **BP 23.04 Infuse New Technologies.** Insert new technologies into the organization's products, work environment, and processes.
- **BP 23.05 Manage innovation.** Manage the innovation of products, processes, and the work environment to support individual projects, improve business results, and ensure easy adoption of further technology improvement initiatives.

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## iCMM v2.0 Application Areas: Purpose, Goals, and Practices

**AA 01 SAFETY AND SECURITY:** to establish and maintain a safety and security capability, define and manage requirements based on risks attributable to threats, hazards, and vulnerabilities, and assure that products and services are safe and secure throughout their life cycle.

# **Application Goals**

- 1. An infrastructure for safety and security is established and maintained.
- 2. Safety and security risks are identified and managed.
- 3. Safety and security requirements are satisfied.
- 4. Activities and products are managed to achieve safety and security requirements and objectives.

## **Application Practices**

**AP 01.01Ensure Safety and Security Competency.** Ensure safety and security awareness, guidance, and competency. **AP 01.02 Establish Qualified Work Environment.** Establish and maintain a qualified work environment that meets safety and security needs.

**AP 01.03 Ensure Integrity of Safety and Security Information.** Establish and maintain storage, protection and access and distribution control to ensure the integrity of safety and security information.

**AP 01.04 Monitor Operations and Report Incidents.** Monitor operations and environmental changes, report and analyze safety and security incidents and anomalies, and initiate corrective actions.

**AP 01.05 Ensure Business Continuity.** Establish and maintain plans to ensure continuity of business processes and protection of assets.

**AP 01.06 Identify Safety and Security Risks.** Identify risks and sources of risks attributable to vulnerabilities, security threats, and safety hazards.

**AP 01.07 Analyze and Prioritize Risks.** For each risk associated with safety or security, determine the causal factors, estimate the consequence and likelihood of an occurrence, and determine relative priority.

**AP 01.08 Determine, Implement, and Monitor Risk Mitigation Plan.** Determine, implement, and monitor the risk mitigation plan to achieve an acceptable level of risk.

**AP 01.09 Determine Regulatory Requirements, Laws, and Standards.** Determine applicable regulatory requirements, laws, standards, and policies and define levels of safety and security.

**AP 01.10 Develop and Deploy Safe and Secure Products and Services.** Develop and deploy products and services that meet safety and security needs, and operate and dispose of them safely and securely.

**AP 01.11 Objectively Evaluate Products.** Objectively verify and validate the work products and delivered products and services to assure safety and security requirements have been achieved and services fulfill intended use.

**AP 01.12 Establish Safety and Security Assurance Arguments.** Establish and maintain safety and security assurance arguments and supporting evidence throughout the life cycle.

**AP 01.13 Establish Independent Safety and Security Reporting.** Establish and maintain independent reporting of safety and security status and issues.

**AP 01.14 Establish a Safety and Security Plan.** Establish and maintain a plan to achieve safety and security requirements and objectives.

**AP 01.15 Select and Manage Suppliers, Products, and Services.** Select and manage products and suppliers using safety and security criteria.

**AP 01.16 Monitor and Control Activities and Products.** Measure, monitor, and review safety and security activities against plans, control products, take corrective action, and improve processes.

## iCMM v2.0 Capability Dimension: Capability Levels, Goals, and Generic Practices

#### CAPABILITY LEVEL 0: INCOMPLETE

One or more of the goals of the process area are not achieved. (No goal or generic practices at this level)

### **CAPABILITY LEVEL 1: PERFORMED**

Goal: The process achieves the goals of the process area.

### **Generic Practices**

- **1.1 Identify Work Scope.** Identify the scope of the work to be performed and work products or services to be produced, and communicate this information to those performing the work.
- **1.2 Perform the Process.** Perform a process that implements the base practices of the process area to provide work products and/or services to a customer.

### CAPABILITY LEVEL 2: MANAGED: PLANNED AND TRACKED

Goal: The process is institutionalized as a managed (planned and tracked) process.

#### **Generic Practices**

- **2.1 Establish Organizational Policy.** Establish and maintain an organizational policy for performing the process.
- **2.2 Document the Process.** Document the process for performing the practices of the process area.
- **2.3 Plan the Process.** Establish and maintain a plan to accomplish the objectives of the process.
- **2.4 Provide Adequate Resources.** Provide resources that are adequate for performing the process as planned.
- **2.5 Assign Responsibility.** Establish responsibility, authority, and commitment for performing the process.
- **2.6 Ensure Skill and Knowledge.** Ensure that the people performing the process have the needed skill and knowledge.
- **2.7 Establish Work Product Requirements.** Establish and maintain requirements on work products and services that result from the process.
- **2.8 Consistently Use and Manage the Process.** Consistently use the documented plans, standards, processes, or procedures in implementing and managing (planning and tracking) the process.
- **2.9 Manage Work Products.** Place identified work products of the process under appropriate levels of configuration management.
- **2.10 Objectively Assess Process Compliance.** Objectively assess adherence of the performed process to the documented process.
- **2.11 Objectively Verify Work Products.** Objectively verify adherence of work products and services to established requirements.
- **2.12 Measure Performance.** Measure performance against the plan.
- **2.13 Review Performance with Higher-level Management.** Review the activities, status, and results of the process with higher-level management.
- **2.14 Take Corrective Action.** Take corrective actions to address problems.
- **2.15 Coordinate with Stakeholders.** Coordinate and communicate among those performing the process and with appropriate stakeholders.

### **CAPABILITY LEVEL 3: DEFINED**

Goal: The process is institutionalized as a defined process.

## **Generic Practices**

- **3.1 Standardize the Process.** Establish and maintain a set of standard processes for the organization, including tailoring guidelines.
- **3.2 Establish and Use a Defined Process.** Establish and use a defined process, designed to meet specific business objectives, that is tailored from the organization's set of standard processes.
- **3.3 Improve Processes.** Collect and use work products, measures, measurement results, and improvement information to improve the standard and defined processes.

### **CAPABILITY LEVEL 4: QUANTITATIVELY MANAGED**

**Goal:** The process is institutionalized as a quantitatively managed process.

Generic Practice: 4.1 Stabilize Process Performance. Select measures key to meeting business objectives and bring processes relevant to those measures under statistical process control.

### **CAPABILITY LEVEL 5: OPTIMIZING**

Goal: The process is institutionalized as an optimizing process

**Generic Practice: 5.1 Pursue Process Optimization.** Pursue improvement to the performance of statistically managed processes based on business objectives, innovation, and removal of common problems.